Relationship between motor and cognitive development in children with developmental disabilities

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Background

- There is an emerging body of evidence showing that motor and cognitive development[1] and motor and language development are intertwined[2].
- Despite an increased interest in motor development, few studies have examined interrelations between motor, cognitive, and language development in children with developmental disabilities or the possible differential effects of type of motor skills on cognitive and language development.

Aim

The aim of this study was to examine the relationship between (fine and gross) motor, cognitive, and language development in children with developmental disabilities.

Method

- Two samples (taken from a larger sample of children who took part in a large-scale research on the Special Needs Addition to the Dutch Bayley Scales of Infant and Toddler Development, Third Edition [Bayley-III-NL])[3]:
  - Children with developmental disabilities (n = 119)
    Presumed developmental age: 0;1 - 3;6 years, and
  - Typically developing children (n = 135)
    Calendar age: 0;3 - 3;6 years.
- The sample of children with developmental disabilities included children with Down syndrome and other genetic disorders, as well as children without a specific diagnosis.
- The instrument used was the Bayley-III-NL.
- Analyses included correlations between results on the motor and cognition scales and between results on the motor and language scales of the Bayley-III-NL.

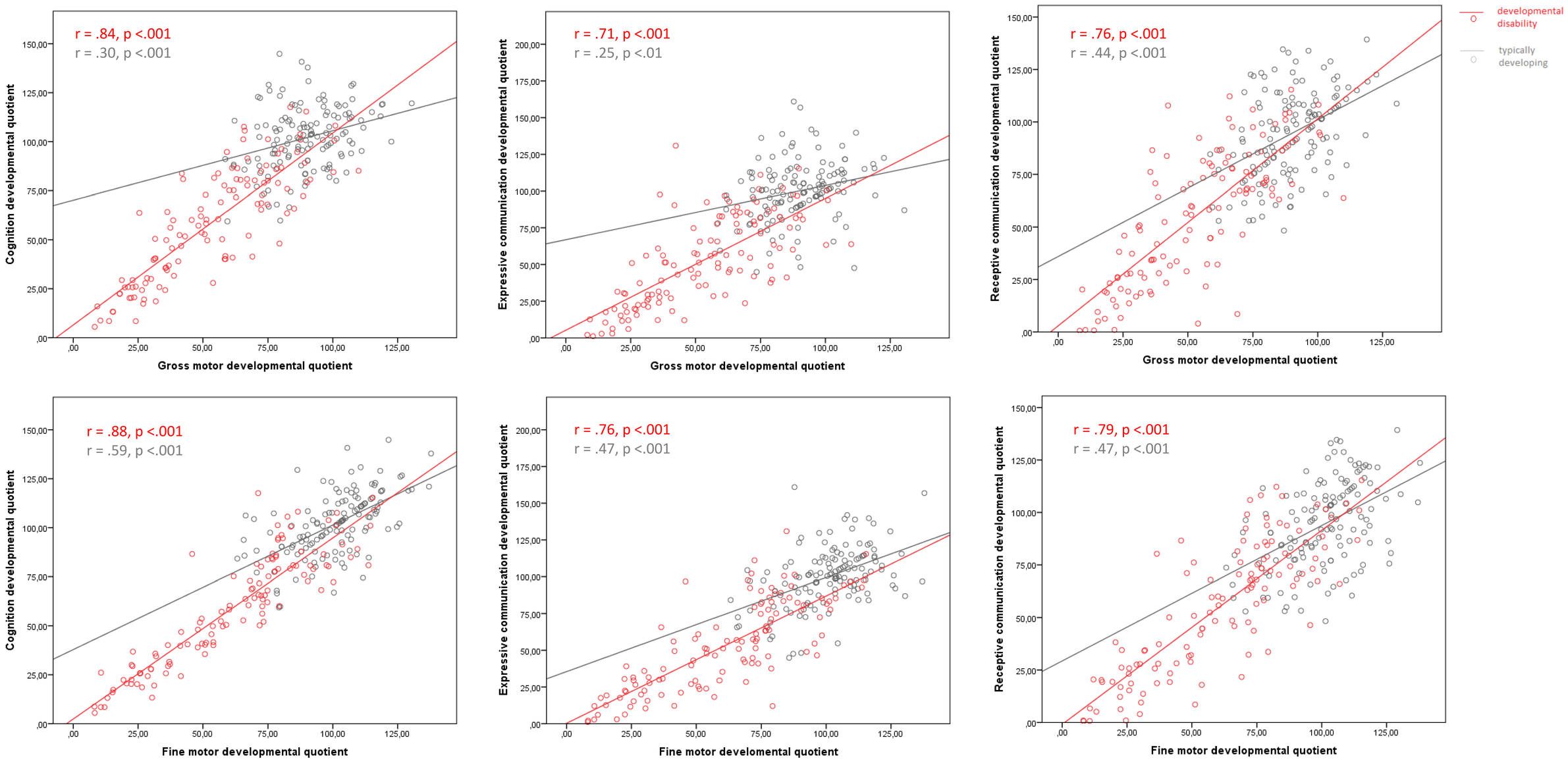

Figure 1. Relationships between motor, cognition, and language scales of Bayley-III-NL.

Results

- Correlations between motor, cognitive, and language development ranged from:
  - .71 to .88 (children with developmental disabilities).
  - .25 to .59 (typically developing children).

Conclusion

- Both fine and gross motor development are strongly associated with cognitive and language development in children with developmental disabilities.
- The new knowledge about the interaction between different developmental domains can have important implications for the support that children with developmental disabilities receive.

References

[1]Diamond, A. (2000). Close interrelation of motor development and cognitive development and of the cerebellum and prefrontal cortex. *Child Development*, *71,* 44-56.

[2]Iverson, J. M. (2010). Developing language in a developing body: The relationship between motor develoment and language development. *Journal of Child Language, 37*, 229-261.

[3]Visser, L. (2014). *The bayley-III-NL special needs addition. A suitable developmental assessment instrument for young children with special needs*. Groningen: Stichting Kinderstudies.

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